

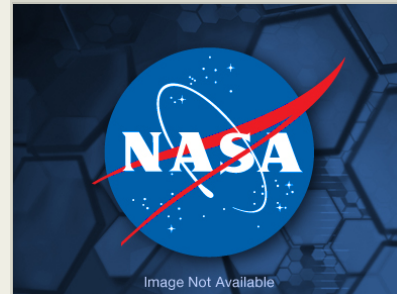
Diffuse X-rays from the Local galaxy (DXL)

Completed Technology Project (2015 - 2018)



Project Introduction

The Diffuse X-rays from the Local galaxy (DXL) mission is the first approved mission dedicated to the study of Solar Wind Charge eXchange (SWCX) and Local Hot Bubble (LHB) emission. DXL is a sounding rocket mission using large area proportional counters to measure the parameters of LHB and SWCX through the spatial signature of their emission. The payload also carries a first prototype wide field-of-view soft X-ray camera using newly-developed micropore reflector technology. DXL was successfully launched from White Sands Missile Range in New Mexico on December 12, 2012 and achieved all of its science objectives. In this cycle, building on the success of the first flight, we plan on continuing the DXL campaign for a complete investigation of the properties and characteristics of LHB and SWCX. In particular, we plan on improving the spectral information of the detector, in the form of three separate counters with different filters defined by the K absorption edge of C, B, and Be. We foresee two additional launches during the three years of this proposal: 1) A second launch from White Sands Missile Range, NM, in the direction of the He focusing cone to gather energy information on LHB and SWCX due to He; 2) A launch from Poker Flat, AK, to look at the spatial signature of geocoronal SWCX to gather energy information on SWCX due to H (the dominant element in Earth's exosphere). In addition, to provide critical information on LHB and SWCX emission, the combination of the two launches will provide invaluable information about the processes responsible for SWCX due to the two primary donor species, H and He. This is essential for any future modeling of SWCX to be used in Astrophysical observations. The scientific goals if the proposed investigation are: (a) a separation and subsequent investigation of LHB and SWCX emission, such as the distribution of the hot plasma within the LHB. (b) a study of the physical parameter of SWCX emission due to both H and He to improve our models of SWCX emission to use in the analysis of past, present, and future X-ray missions. This proposal is for a scientific investigation. The technology is fully developed, well-understood, and ready to fly. Our hardware preparedness makes this investigation straightforward, cost effective, and well defined in its timeline.



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Organizational Responsibility

Responsible Mission Directorate:

Science Mission Directorate (SMD)

Responsible Program:

Astrophysics Research and Analysis

Project Management

Program Director:

Michael A Garcia

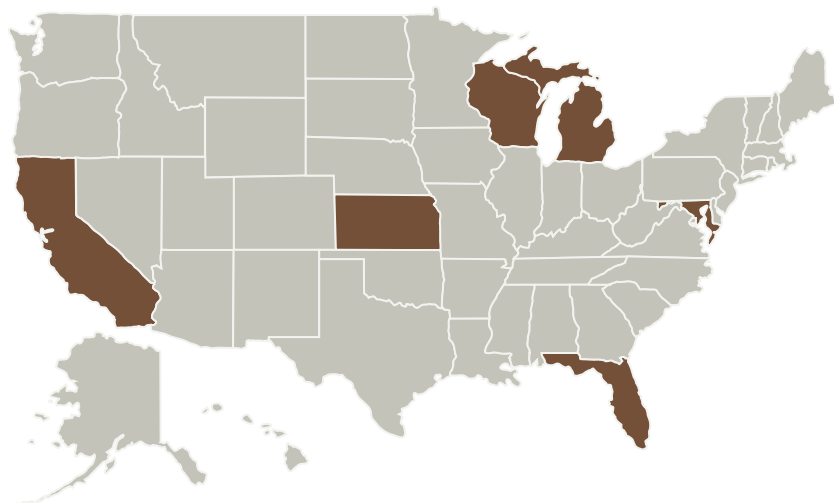
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Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
University of Miami	Supporting Organization	Academia	Coral Gables, Florida

Primary U.S. Work Locations	
California	Florida
Kansas	Maryland
Michigan	Wisconsin

Project Management
(cont.)**Program Manager:**

Dominic J Benford

Principal Investigator:

Massimiliano Galeazzi

Co-Investigators:

Suzanne L Page
 Brian M Walsh
 Thomas E Cravens
 Meng P Chiao
 Susan Lepri
 Wenhao Liu
 Dan Mccammon
 Michael Collier
 David G Sibeck
 Dimitra Koutroumpa
 Kip D Kuntz
 Frederick S Porter
 Nicholas E Thomas
 Steven L Snowden

Technology Areas

Primary:

- TX13 Ground, Test, and Surface Systems
 - TX13.3 Assembly, Integration and Launch
 - TX13.3.1 Offline Element Processing

Target Destination

Outside the Solar System